

## Delirium

Marcella Pascualy, MD  
Heidi Combs, MD

## Delirium

- It is a neuropsychiatric syndrome also called acute confusional state or acute brain failure that is common among the medically ill and often is misdiagnosed as a psychiatric illness which can result in delay of appropriate medical intervention. There is significantly mortality associated with delirium so identifying it is crucial!

## DSM IV Criteria

1. Disturbance of consciousness with reduced ability to focus, sustain or shift attention.
2. A change in cognition or development of perceptual disturbances that is not better accounted for a preexisting, existed or evolving dementia.
3. The disturbance develops over a short period of time and tends to fluctuate during the course of the day
4. There is evidence from this hx, PE or labs that the disturbance is caused by the physiological consequence of a medical condition.

## Clinical characteristics

- Develops acutely (hours to days)
- Characterized by fluctuating level of consciousness
- Reduced ability to maintain attention
- Agitation or hypersomnolence
- Extreme emotional lability
- Cognitive deficits can occur

## Clinical characteristics: cognitive deficits

- Language difficulties: word finding difficulties, dysgraphia
- Speech disturbances: slurred, mumbling, incoherent or disorganized
- Memory dysfunction: marked short-term memory impairment, disorientation to person, place, time.
- Perceptions: misinterpretations, illusions, delusions and/or visual (more common) or auditory hallucinations
- Constructional ability: can't copy a pentagon

## Types of delirium

- Hyperactive or hyperalert
  - the patient is hyperactive, combative and uncooperative.
  - May appear to be responding to internal stimuli
  - Frequently these patients come to our attention because they are difficult to care for.

➤ Hypoactive or hypoalert

- Pt appears to be napping on and off throughout the day
- Unable to sustain attention when awakened, quickly falling back asleep
- Misses meals, medications, appointments
- Does not ask for care or attention
- This type is easy to miss because caring for these patients is not problematic to staff

➤ Mixed

- a combination of both types just described
- The most common types are hypoactive and mixed accounting for approximately 80% of delirium cases

### Epidemiology- Delirium occurs in:

- approximately 40% of hospitalized elderly pts >65 yo
- approximately 50% of pts post-hip fracture
- approximately 30% of pts in surgical intensive care units
- approximately 20% of pts on general medical wards
- approximately 15% of pts on general surgical wards

### Etiology

- It is usually multifactorial
  - Systemic illness
  - Medications- any psychoactive medication can cause delirium
  - Presence of risk factors

### Etiology: Systemic illnesses

- Infections
- Electrolyte abnormalities
- Endocrine dysfunctions (hypo or hyper)
- Liver failure- hepatic encephalopathy
- Renal failure- uremic encephalopathy
- Pulmonary disease with hypoxemia
- Cardiovascular disease/events: CHF, arrhythmias, MI
- CNS pathology: tumors, strokes, seizures
- Deficiency states: Thiamine, nicotinic or folic acid, B12

### Etiology: Drugs

- Anticholinergics (furosemide, digoxin, theophylline, cimetidine, prednisolone, TCA's, captopril)
- Analgesics (morphine, codeine..)
- Steroids
- Antiparkinson (anticholinergic and dopaminergic)
- Sedatives (benzodiazepines, barbiturates)
- Anticonvulsants

## Etiology: Drugs continued

- Antihistamines
- Antiarrhythmics (digitalis)
- Antihypertensives
- Antidepressants
- Antimicrobials (penicillin, cephalosporins, quinolones)
- Sympathomimetics

## Predisposing risk factors

- >60 years of age
- Male sex
- Visual impairment
- Underlying brain pathology such as stroke, tumor, vasculitis, trauma, dementia
- Major medical illness
- Recent major surgery
- Depression
- Functional dependence
- Dehydration
- Substance abuse/dependence
- Hip fx
- Metabolic abnormalities
- Polypharmacy

## Precipitating risk factors

- Meds (see list)
- Severe acute illness
- UTI
- Hyponatremia
- Hypoxemia
- Shock
- Anemia
- Pain
- Orthopedic surgery
- Cardiac surgery
- ICU admission
- High number of hospital procedures

## Important Rule-outs

- Wernicke's
- Hypoxia
- Hypoglycemia
- Hypertensive encephalopathy
- Meningitis/encephalitis
- Poisoning
- Anticholinergic psychosis
- Subdural hematoma
- Septicemia
- Subacute bacterial endocarditis
- Hepatic or renal failure
- Thyrotoxicosis/myxedema
- Delirium tremens
- Complex partial seizures

## The pathophysiology of delirium

- Many hypotheses exist including:
- Neurotransmitter abnormalities
- Inflammatory response with increased cytokines
- Changes in the blood-brain barrier permeability
- Widespread reduction of cerebral oxidative metabolism
- Increased activity of the hypothalamic-pituitary adrenal axis

## How to evaluate a patient with suspected delirium

- Look at chart notes with particular attention to level of consciousness, behavior and level of cooperativeness
- Look at the overall time course
- Review med list including scheduled, prns doses, recent meds discontinued or started
- Evaluate for recent medical illness and interventions
- Screen for history of substance dependence to determine risk of withdrawal

- Review diagnostic studies including labs, imaging, vital signs
- Interview patient paying close attention to concentration, level of somnolence, mood lability, executive function, short term memory deficits, kinetics. Use MMSE.
- Gather collateral information from family/friends regarding baseline function, personality, psych history

## Testing

- Mini mental status exam (MMSE) is not sensitive in identifying delirium however repeated MMSEs can reveal waxing and waning course
- Most sensitive items are serial 7's, orientation, recall memory
- Tests of attention include serial 7's, spelling WORLD backwards, months of the year backward, counting down from 20

## Differentiating between delirium and a psychiatric disorder

- Clouded consciousness or decreased level of alertness
- Disorientation
- Acuity of onset and course- serial mental status exams can help demonstrate this
- Age >40 without prior psych history
- Presence of risk factors for delirium, recent medical illness or treatment

## Dementia vs Delirium

- Dementia has an insidious onset, chronic memory and executive function disturbance, tends not to fluctuate. In delirium cognitive changes develop acutely and fluctuate.
- Dementia has intact alertness and attention but impoverished speech and thinking. In delirium speech can be confused or disorganized. Alertness and attention wax and wane.

## Schizophrenia vs Delirium

- Onset of schizophrenia is rarely after 50.
- Auditory hallucinations are much more common than visual hallucinations
- Memory is grossly intact and disorientation is rare
- Speech is not dysarthric
- No wide fluctuations over the course of a day

## Mood disorders vs Delirium

- Mood disorders manifest persistent rather than labile mood with more gradual onset
- In mania the patient can be very agitated however cognitive performance is not usually as impaired
- Flight of ideas usually have some thread of coherence unlike simple distractibility
- Disorientation is unusual in mania

## Treatment

- First and foremost treat the underlying cause
- Environmental interventions: cues for orientation (calendar, clock, family pictures, windows), frequently reorient the patient, have family or friends visit frequently making sure they introduce themselves, minimize staff switching.
- Minimize psychoactive medications

## Treatment-meds

- Antipsychotics decrease psychotic sx, confusion, agitation
- Antipsychotics- IV Haldol is first line because of significantly reduced risk of Extrapyramidal side effects. Onset of action within 5-20 minutes. After IV dose established transition to BID or qhs oral dose and taper.
- Some data now supports use of atypical antipsychotics: Risperdal 0.5-2mg, Quetiapine 12.5-50mg, Olanzapine 2.5-10mg.

## Course and Prognosis

- Prodromal symptoms may occur a few days prior to full development of symptoms
- The symptoms will continue to progress/fluctuate until underlying cause treated
- Most of the symptoms of delirium will resolve within a week of correction/improvement of the underlying etiology HOWEVER symptoms may wax and wane. In some patients it can take weeks for the symptoms to resolve.
- Some patients, particularly older patients, may never return to baseline

## Education

- Let the family know what is going on including that delirium waxes and wanes and can last for several weeks
- Once the patient starts to improve explain to them what delirium is, how common it is and the usual course. It is very frightening for them and may fear they have a psychiatric illness.

## Case 1

Mr E is a 71 yo gentleman with hx of asthma, BPH and HTN admitted to medicine 3 days ago for bilateral lower extremity cellulitis. At the time of admission he was cooperative and oriented but over the past 24 hours has become occasionally confused, agitated, uncooperative and somnolent. He appears to be talking to someone in his room when no one is there.

His current meds include: lisinopril, naproxen, cimetidine, albuterol/ipratropium inhaler, levofloxacin, oxygen via nasal canula prn  
He has no known psych history, drinks 1-2 glasses of wine/night  
The medicine service is concerned he is psychotic and requests help managing his behavior.

- When you speak to him he is difficult to rouse and falls asleep several times. He struggles to maintain focus on questions and is unable to perform the mental status exam. He believes he is in Oklahoma and that you are his cousin.

## What points to delirium?

- Altered mental status developing over a short period of time
- Alternating agitation, confusion and somnolence
- Auditory hallucinations in a 70 yo with no previous psych history
- Several of his meds could cause delirium including cimetadine, inhalers, naproxen. He is also need O2 which indicates hypoxia at times

- Multiple medical possibilities including:
  - Meds including cimetadine, inhalers, naproxen.
  - Hypoxia- he is needing O2 at times
  - Cellulitis
  - Stroke with his history of HTN
  - UTI with history of BPH
  - Metabolic abnormalities including electrolyte or glucose disturbances, liver or renal dysfunction, thyroid dysfunction
  - Alcohol withdrawal

## Case 2

- Mr R is 83 yo gentleman with a long history of hypertension, diabetes with peripheral neuropathy and occasional angina admitted to medicine 4 days ago for failure to thrive. Two weeks prior to admission he missed his weekly bridge game which he has not done in 12 years. The day prior to admit his friend found him asleep in front of the TV and was difficult to rouse. He was minimally communicative, had been incontinent of urine and hadn't eaten in several days. His friend denied history of mental illness, substance abuse and noted he is usually social and friendly.

- On admission he was calm, cooperative but withdrawn. He was hyponatremic and had a UTI which have been treated but remains somnolent and withdrawn. Medicine is requesting assistance for evaluation of depression.
- Current meds: insulin, atenolol, lisinopril, temazepam, azithromycin, aspirin.
- On exam he is quite, answers questions with monosyllabic answers, has poor eye contact and scores a 9/30 on MMSE with very poor effort.

## He is presenting as a classic example of hypoactive delirium however:

- Urinary incontinence with altered mental status should prompt concerns about normal pressure hydrocephalus
- He could have had a stroke or fall given his diabetes, hypertension and peripheral neuropathy- he needs a head CT
- The UTI and hyponatremia could cause delirium and even with appropriate treatment mental status may take weeks and even months in the elderly- some may never return to baseline

### Other possible contributing factors:

- Meds such as benzodiazapines
- Glycemic abnormalities- how are his blood sugars?
- Would need to rule out alcohol withdrawal or overdose-always do a urine tox screen
- Is he depressed?
- Is he demented?
- The low MMSE reveals severe impairment which is common in delirium. His poor effort could signal inattention or depression.